Will the Robots take care of Grandma?

Jerry A. Jacobs
University of Pennsylvania
June 2018
Thanks...

• To Tina Wu, U. Penn and NYU Stern School of Business
• The Institute for Women’s Policy Research
• To the Mack Institute for Innovation Management, The Wharton School, University of Pennsylvania
My job was outsourced to another robot in China...
Headlines that claim to pinpoint job losses due to the robot invasion are irresistible.
THE BRITISH ARE COMING
CHEER UP CHAPS
THE BRITISH ARE COMING
THE BRITISH ARE COMING!

THE MERSEY BEATLES
FOUR LADS FROM LIVERPOOL
In this case, it is not the redcoats, or some Beatles tribute band, but health care robots:

• Former health minister Lord Darzi, a leading surgeon, said nearly a third of care staff tasks could be handed over to robots.

• Its projections - the first detailed analysis to examine such trends - forecast that **almost a third of work currently done by nurses and GPs, and nearly one quarter of the tasks done by hospital doctors could be done by robots or AI systems**...saving 1/10th of NHS budget

• His call is in an Institute of Public Policy Research report due our next week.

• **IPPR, the Institute for Public Policy Research, is the UK's leading progressive think tank**

The General Public is Coming to Believe in the Automated Future

• American Staffing Association Poll (2017):
  • 83% say “automation will revolutionize work”
  • 82% say “this change is inevitable”
  • 72% say “will lead to higher unemployment”

• Recent Gallup Poll shows similar results
Business Leaders are Coming to Believe in an Automated Future

• 90% say there are real advantages to automation at their organization, including
  • Reduction in manual errors (48%)
  • Faster completion of tasks (42%)
  • Better quality work product (38%)

• 61% say automation can be “easily implemented in their industry in the next 12 months”
The jobless future has both conservative and liberal versions

• The conservatives stress the idea that the minimum wage should be kept low. Uppity workers should be quiet and grateful for their $7.25 jobs, lest employers speed up the deployment of their robot replacements.

• The liberal/radical reply is that the increasingly jobless world will require a detachment of income and work via a Universal Basic Income.
Debates about the future of work tend to gravitate to extreme positions

• Silicon Valley futurists believe that the solution to most if not all of the worlds problems is an app away

• Critics worry about the “super-intelligent” robots taking over the world and treating humans as pets (at best)
Our focus today is on elder-care

- Seek to build on Osterman’s fine book, *Who Will Care for Us?*
- Osterman argues that the shortage of home health workers is due to low pay, poor working conditions, disrespect, and restrictions on the tasks that aides can perform
- Home health aides: overwhelming women, disproportionately minority, low paid and susceptible to high turnover
- The simplest reform is to push for full-time employment status.
- Occupational therapists and nurses who provide care in the home are often full-time: why not home health aides?
- This would provide benefits, reduce turnover and could attract more prospective workers to the field
- Obvious second reform is raising pay to reduce turnover and allow for greater investment in skills
- Higher quality home care will help to reduce institutional care and reduce the overall cost of elder care.
Osterman’s otherwise excellent study largely ignores the role of new technologies

- Will technologies address the shortage of elder care workers?
- Not focusing here so much on humanoid robots but rather on a wide range of new technologies
Charting a realistic middle ground in the route forward

• I believe that technology will gradually change the nature of elder care, but that technology won’t fully replace either paid or unpaid work.

• The gradual adoption of a wide variety of technologies will in all likelihood facilitate aging in place. This will shift work from expensive institutional settings to lower-cost home-based services.

• Technology is not going to replace home health aides, but rather in all likelihood is going to increase the demand for home health aides.

• And it will probably increase the burden on adult family caregivers by extending the time elders remain living independently, even as particular tasks are sometimes automated.
Investing in the elder care labor force, combined with support for home-based technologies, represent a path forward for elder care in the US

- Home care is much less expensive than care provided in institutional settings
- Technology should not be viewed as replacing workers
- Technology combined with a better paid, better skilled home care labor force with lower turnover will improve the quality of life for our elders while simultaneously reducing costs
Life expectancy at age 65 (in US in 2015)

• 18.0 for men
• 20.6 for women
• OECD data
Older Population by Age: 1900-2050 - Percent 60+, Percent 65+, and 85+
Figure 1

The 65 and Over Population Will More Than Double and the 85 and Over Population Will More Than Triple by 2050

Number of Projected Centenarians by Race, Middle Series: 2000 to 2050

15 of 30 Fastest Growing Occupations are in Health Care
Percent Change, 2016–26

- Home health aides: 47.3%
- Personal care aides: 38.6%
- Physician assistants: 37.3%
- Nurse practitioners: 36.1%
- Physical therapist assistants: 31.0%
- Physical therapist aides: 29.4%
- Medical assistants: 29.0%
- Occupational therapy assistants: 28.9%
- Physical therapists: 28.0%
- Massage therapists: 26.3%
- Health specialties teachers, postsecondary: 25.9%
- Occupational therapy aides: 24.7%
- Phlebotomists: 24.5%
- Nursing instructors and teachers, postsecondary: 24.0%
- Occupational therapists: 23.8%
- Total, all occupations: 7.4%
Occupations by Number of Workers, 2016

- Personal care aides: 2,016,100
- Home health aides: 911,500
- Medical assistants: 634,400
- Physical therapists: 239,800
- Health specialties teachers, postsecondary: 233,500
- Massage therapists: 160,300
- Nurse practitioners: 155,500
- Occupational therapists: 130,400
- Phlebotomists: 122,700
- Physician assistants: 106,200
- Physical therapist assistants: 88,300
- Nursing instructors and teachers, postsecondary: 67,900
- Physical therapist aides: 52,000
- Occupational therapy assistants: 39,300
- Occupational therapy aides: 7,500
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<th>Occupation</th>
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Many elders greatly value aging in place

• AARP – some 90 percent of elders surveyed prefer to remain in their own homes, even if they need day-to-day assistance (82 percent)

• Movement to a nursing home or other care setting can be prompted by a fall, escalating concerns about safety, ongoing challenges with activities of daily life (ADL), family caregiver’s unavailability or exhaustion, and the onset or worsening of dementia
Technologies

- Not really focused on robots per se
- While each technology may help in a small way, for the foreseeable future the addition of these technologies will not replace workers but will shift elder care toward home care and away from institutional settings
Technologies will gradually begin to help with some of IADL’s (Instrumental Activities of Daily Living)

• “Smart homes” can help with shopping for food and other staples
  • Refrigerators that make a shopping list of items that are running low or are out of date
  • Shopping list can be sent automatically to the store (or the Amazon warehouse)
  • Groceries, paper supplies and perhaps even pharmaceuticals can be delivered to the apartment or home
Transportation Technologies

• While self-driving cars may not arrive for some time, interim technological improvements may be helpful

• AAA reports that elders currently outlive their ability to drive safely by 7-10 years

• Adaptive cruise control can help avoid accidents, by:
  • By braking in order to avoid hitting the next vehicle
  • By helping the vehicle to remain in lane
  • By self-parking in places that elders might otherwise avoid
Technologies on the horizon might assist with personal mobility

- Wearable air bags to reduce the impact of falls
- Exoskeletons
  - Can assist elders with walking
  - Can assist home aides in lifting clients/patients
  - #1 occupational injury facing home health aides are back injuries
HIP'AIR PERSONAL AIRBAG
Medical technologies:

• Monitors and Sensors
  • Blood pressure
  • Glucose levels
  • Motion detectors – for falls, lack of movement
  • “Smart” pill dispensers

• Sensors detect patterns
  • When someone gets out of bed
  • When a refrigerator is opened
  • When a toilet is flushed
  • Can use AI to search for deviations from regular routine
Medical Communication

• Telemedicine
• Connecting monitors and sensors to central monitoring stations
• Tradeoff: invasion of privacy vs. remaining in own home
Continuing Medical Breakthroughs

• Advances in care for cancer, heart disease, diabetes, stroke and other illnesses affecting the elderly

• The cumulative effect of these advances is to lengthen the number of healthy years that elders can expect to live

• Thus far gains have been concentrated among middle class individuals, and thus there is potential for the diffusion of these gains to those with less education and more limited finances
Voice Activation Reduces the Skills Gap in Elder-care Technologies

• Not all elderly are able or willing to adopt new technologies
• The affluent are in all likelihood going to benefit first
• But voice activation reduces the gap between the tech-savvy and the tech-challenged, just as smart phones reduced the digital divide
Amazon Echo and other personal assistants:

• Can be programmed to remind elders to take their medicines
• Can be programmed to call family, neighbors or emergency lines for help
• Voice is just easier for many to use than typing in commands, navigating menus of options, etc.
Some technologies – such as telemedicine, may work better in a facility setting than at home

• Economies of scale mean that real robots are likely to appear in institutional settings before they are widely adopted at home

• Nonetheless, technologies may help answer the threshold question – can I take care of myself? or do I need to move to an institutional setting? – in the direction of staying at home
Technology and training for home health aides

• The range of new technologies may gradually lead elders to demand aides who are conversant with monitors, sensors, smart home and other technologies.
Investing in the elder care labor force, combined with support for home-based technologies, represent a path forward for elder care in the US.

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- Technology combined with a better paid, better skilled home care labor force with lower turnover will improve the quality of life for our elders while simultaneously reducing costs.
end
Number of licensed nursing home beds in the United States from 1994 to 2015 (in 1,000)